

**Commonwealth of Kentucky**  
**Division for Air Quality**  
**DRAFT PERMIT STATEMENT OF BASIS**

DRAFT CONDITIONAL MAJOR PERMIT NO. F-06-022

SUPERIOR BATTERY MANUFACTURING

RUSSELL SPRINGS, KY.

AUGUST 8, 2006

RITA ARGUELLO, REVIEWER

PLANT I.D. # 021-207-00019

APPLICATION ACTIVITY # APE20050003

AI# 3893

**GENERAL SOURCE DESCRIPTION:**

Superior Battery Manufacturing produces lead acid storage batteries. Lead acid storage batteries are produced from lead alloy ingots and lead oxide; the lead oxide is manufactured at the plant. Battery grids are manufactured by the casting operations. In the casting operation, lead alloy ingots are charged to a melting pot, from which the molten lead flows into grids from lead sheets. The grids are cured. The pastes used to fill the battery grids are made in batch-type processes. A mixture of lead oxide powder, water and sulfuric acid produces a positive paste, and the same ingredients in slightly different proportions with the additions of an expander (carbon black and other) make the negative paste. Pasting machines then force these pastes into the interstices of the grids, which are made into plates. To provide optimum conditions the plates are placed into humidity curing chambers. Casting and Pasting could produce 5,400,000 twenty-pound lead battery plates per year. After the plates are cured they are sent to the 3-process operation of plate stacking, plate burning, and element assembly in the battery case. The positive and negative plates are set in the box by block with insulators between them.

During the dry-charge formation, the battery plates are immersed in a dilute sulfuric acid solution. The positive plates are connected to the positive pole and the negative plates are connected to the negative pole. The diluted acid is dumped and new stronger acid is added and a boost charge is applied to complete the battery.

The assembly or 3-process operation is the bottleneck, limiting the production of batteries to 1,525,000 twenty-pound batteries per year. Superior Battery Manufacturing is proposing a voluntary limit capacity to 30,502,000 lbs per year of lead in the assembly – 3-process operation.

The Formation operation is installed in another building but is considered to be part of the battery manufacturing and considered as one source. This operation has a production rate of 400 batteries per hour at 8,400 hour/year totaling 3,360,000 batteries/year. The plant purchased 19,780,596 lbs total lead in 2004, not including Pb6 and lead strip. All the information is taken from the application that was submitted May 21, 2005.

A thorough analysis has been made of all relevant information available that pertains to this source. The Division has concluded that compliance with the terms of the permit will ensure compliance with all air quality requirements and determination that a draft Conditional Major permit should be issued, instead of a registered source designation as requested by Superior Battery Manufacturing

**INDIVIDUAL UNIT, OPERATION OR ACTIVITY EMISSION AND OPERATING CAPS:**

KYEIS No.	Emission Unit	Contaminant	Regulation	Limitation	Monitoring
PbO1 PbO2	Oxide Mill 1 and 2 OM2, OM1	Lead, Particulate matter	401 KAR 63:020 Potentially hazardous matter or toxic substances. 401 KAR 60:005 standards of performance for new stationary sources. 60.372 Subpart KK 401 KAR 59:010 New process operations.	5.0 mg Pb/dscm	Baghouse pressure drop HEPA pressure drop Visible emissions
C1	Casting	Lead, Particulate matter	401 KAR 63:020 401 KAR 59:010 401 KAR 60:005 60.372 Subpart KK	.40 mg Pb/dscm opacity 0%	Baghouse pressure drop Visible emissions Observed once per day
P1	Pasting	Lead, Particulate matter	401 KAR 63:020 401 KAR 59:010 401 KAR 60:005 60.372 Subpart KK	1.0 mg Pb/dscm Opacity is 0%	Baghouse pressure drop HEPA pressure drop Visible emissions Observe once per day
3-PAB, 3-PC	3-Process lines A, B and C 3PA, 3PC	Lead, Particulate matter	60.372 Subpart KK 401 KAR 63:020 401 KAR 59:010 401 KAR 60:005 NSPS	1.0 mg Pb/dscm Opacity is 0%	Baghouse pressure drop HEPA pressure drop Visible emissions Observe once per day
HSA HSB HSC	Heat Seal Lines A, B and C HSA, HSB, HSC	Particulate Visible	401 KAR 59:010		Visible emission observations
SP1	Small Parts Cast	Lead Particulate matter	60.372 Subpart KK 401 KAR 59:010	1.0 mg Pb/dscm Opacity is 0%	Pressure gauge Observe emissions Opacity
SP2	Battery Cable Manufacturing	VOC			Keep track of total quantity of paint primer used, assume 100% VOC content
Frm1	Battery Formation Mist Eliminator 1, 2 and 3. FS1, FS2, FS3	Sulfuric Acid	401 KAR 59:010	Pressure drop. Once per day. Maximum opacity 20%	Pressure drop across. mist eliminators pH of mist eliminator wash water. Visual observation of stack

**EMISSION AND OPERATING CAPS DESCRIPTION:**

The Lead processed shall not exceed 30,502,000 lbs. per year.

1. Total particulate emissions from the entire source shall not exceed 90 tons/year.
2. Individual HAP emissions from this source shall be less than 9.0 tons/year based on a 12-month rolling total.
3. Plant-wide total HAP emissions from this source shall be less than 22.5 tons/year based on a 12-month rolling total.

**Regulation applicable:**

401 KAR 52:030 Federally enforceable permits for nonmajor sources.  
401 KAR 59:010 New process operations.  
40 CFR 60:370 subpart KK.

**Emission Factors:**

The emissions factors used in this permit are from AP 42 Vol. II source for lead and particulate matter. Emission factors for sulfuric acid mist were provided by Superior Battery.

**Control and Efficiency:**

Lead emissions are controlled by fabric filter baghouses with efficiencies ranging from 60 to 99.97%. Scrubbers control sulfuric acid mist with efficiency of 95%. Emissions from natural gas combustion are control with baghouses with efficiency of 50%.

**Test:**

All stacks to be tested during this permit period subject to 40 CFR 60:370 subpart KK.

**Monitoring:**

Superior Battery shall maintain monthly record of lead processed.

**CREDIBLE EVIDENCE:**

This permit contains provisions, which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.